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Finding a Life Worth Living: Meaning in Life and Graduation from College

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Abstract

Graduation from college is an important milestone for young adults, marked by mixed emotions and poignancy, and therefore is an especially salient context for studying meaning in life. The present research used experience-sampling methodology to examine the antecedents and consequences of students' experience of meaning in life over the course of graduation. Participants were 74 graduating students who provided a total of 538 reports over the span of three days, including commencement day. Increased levels of state meaning in life during the days around commencement were linked to spending time with people in general and with family in particular, as well as thinking about one's years in college. Thinking about one's years in college mediated the effects of present company on state meaning in life. Graduates who experienced higher levels of state meaning in life during the days around their commencement ceremony had higher trait levels of meaning in life one week following commencement. We discuss how making meaning of a poignant experience has implications for healthy psychological development.

Keywords

Meaning in life; sociogenomic theory; multilevel modeling; experience-sampling methodology; graduation

Graduation from college marks an important milestone in life. It is a time to celebrate achieving a seminal life goal while leaving behind a formative stage in life. With the close of university life also come new beginnings and challenges associated with taking on a more adult role in society. It is perhaps due to these complexities that graduates typically experience heightened poignancy and mixed emotions of happiness and sadness over the course of graduation events (Ersner-Hershfield, Mikels, Sullivan, & Carstensen, 2008; Larsen, McGraw, & Cacciopo, 2001; Zhang & Fung, 2009). Several studies have looked into emotional and personality development during graduation from school or college (e.g., Bleidorn, 2012; Ersner-Hershfield, et. al, 2008; Zhang & Fung, 2009). However, less is

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known about students' experience of meaning in life (MIL) during this major transitional period. MIL encompasses a feeling of purpose in life, the belief that existence is significant, and the view that the world is coherent (Baumeister, 1991; Heintzelman & King, 2014; Park, 2013).[1] The lack of focus on MIL in previous studies is surprising given the emphasis on relations between achieving life goals and meaning (Klinger, 1977), as well as graduation's nostalgic component and its forward-looking nature (Kurtz, 2008).

The present project was aimed to examine the antecedents and consequences of experiences of MIL during graduation from college. We were concerned both with trait MIL and state MIL. Trait MIL reflects one's global judgment of MIL or general tendency to experience MIL (Crumbaugh & Maholick, 1964; Morgan & Farsides, 2009; Schulenberg, Schnetzer, & Buchanan, 2011; Steger, Frazier, Oishi, & Kaler, 2006), whereas state MIL represents short-term variations in a person's experience of MIL over time (King, Hicks, Krull, & Del Gaiso, 2006), Specifically, we were interested in the conditions of students' moment-to-moment experiences of state MIL during their week of commencement and their global judgments of MIL prior to and after commencement. We looked at whether the activities students engaged in over the course of graduation were related to state experiences of MIL. We then examined whether state MIL over the course of graduation was related to global judgments of MIL made before and after commencement.

Several studies have shown that individuals who report higher levels of trait MIL tend to have higher levels of psychological well-being and are less likely to experience psychological difficulties (Routledge, Arndt, Wildschut, Sedikides, Hart, Juhl, et al., 2011; Schulenberg, Schnetzer, & Buchanan, Steger, Frazier, Oishi, & Kaler, 2006). The benefits of trait meaning in life are also evident in a more well-defined sense of self and enhanced feelings of connection with others (Schlegel, Hicks, King & Arndt, 2011; Lambert, Stillman, Hicks, Kamble, Baumeister, & Fincham, 2013). State MIL is related to positive affect (King et al., 2006), nostalgia (Routledge et al., 2011), and perceived knowledge of one's true self-concept (Schlegel, Hicks, King, & Arndt, 2011). Thus it is important to study MIL and determine its causes and consequences, both over long time spans and relatively short periods of time. As noted above, graduation from college might provide a particularly fruitful context in which to examine the short-term experience of MIL, as it marks a significant life transition.

Development of Meaning in Life over a Uniquely Important Transition

Finding MIL is an important life task that becomes particularly salient during early adulthood (McAdams, 2001). Society explicitly and implicitly urges young adults to "get a life" (Habermas & Bluck, 2000), as it is the time to make decisions about one's career, marriage, and family. Thus, graduates are going through a time in life when establishing

[1]Although purpose in life may be conceptualized as a narrower facet of the broader construct meaning in life - which also may encompass the belief that existence is significant and the view that the world is coherent (Baumeister, 1991; Park, 2013), most research does not distinguish between the terms meaning and purpose (e.g., King et al., 2006; Steger et al., 2006). Indeed, Heintzelman and King 2014 noted that "most measures of purpose in life include the word *meaning*, and all measures of meaning in life include the word *purpose*" (p. 561). As the measures in the current study included items measuring both meaning and purpose, we refer to the broader construct of meaning in life (MIL) in this paper. For a deeper discussion of the conceptual differences between meaning and purpose, see Hill, Burrow, Sumner, and Young (2015).

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MIL is a crucial developmental task. Developmental tasks may be defined as "age-graded normative tasks based on societal expectations about the developmental milestones that should be reached in specific life phases" (Hutteman, Hennecke, Orth, Reitz, & Spect, 2014, p. 267). They are characterized by occurring in a normative sequence across the lifespan - e.g., graduating from high school, graduating from college, achieving a steady job, retiring - and by bringing about a transition in status or roles (Luhmann, Orth, Specht, Kandler, & Lucas, 2014). Graduation, when conceived of as a developmental task, also can be seen as a transition to adulthood (Hutteman et al., 2014) and as the culmination of a time when students are actively thinking about their life's meaning (King & Hicks, 2009).

It is thought that navigating developmental tasks successfully may result in greater levels of maturity (Bleidorn, in press; Roberts & Mroczeck, 2008; Hutteman et al., 2014). There are likely to be individual differences in the degree to which people successfully negotiate developmental tasks, and those differences might have longer-lasting impacts on a person's psychological makeup. Indeed, this is reflected in the literature on developmental tasks in early adulthood. For example, higher levels of competence in the developmental tasks of friendship and academics at around age 20 predicted greater success in the domains of work and romance 10 years later (Roisman, Masten, Coatsworth, & Tellegen, 2004). Furthermore, improvements in social support and getting married over the ages of 18 to 25 are related to increased levels of emotional well-being over that age range (Galambos, Barker, & Krahn, 2006). Conversely, difficulties in romantic relationships between these ages are related to increased negative emotionality (Robins, Caspi, & Moffitt, 2002).

The Sociogenomic Approach to Personality Change

In regard to graduation, although this transition is generally experienced as positive (King & Hicks, 2009), there is reason to believe that some individuals will experience this time as a more meaningful time than others. For example, college students who spent more time participating in college life had higher meaning in life (Molasso, 2006), and students who identified more with their universities experienced more poignancy when graduating (Zhang & Fung, 2009). We will examine whether differences in state MIL experienced during the course of graduation events feed back into global judgments of MIL. By doing so, we are adopting a *sociogenomic* perspective on development (Roberts & Jackson, 2008). The sociogenomic perspective is so named because it draws from sociogenomic biology, which has shown that environmental factors can have an effect on biological factors, including genetic effects (Krueger & Johnson, 2008).

As applied to personality, the sociogenomic perspective posits that environments can exert impact on psychological states (momentary patterns of cognitions, affects, and behaviors), and those states can have an impact on more global traits (Heller, Perunovic, & Reichman, 2009; Roberts & Jackson, 2008; Roberts, Wood, & Caspi, 2008). Support for the idea that narrower psychological roles or states can have effects on broader, trait-like characteristics is growing. Wood and Roberts (2006) found that, over a six-month lag, role-identity traits (e.g., extraversion in a romantic relationship) predicted subsequent changes in general traits. Bleidorn (2012) showed that increases in achievement behaviors (e.g., studying, doing homework) in high school students were predictive of increases in trait conscientiousness

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over a one-year time period. Hutteman, Nestler, Wagner, Egloff, and Back (2015) determined that changes in state self-esteem in high school students during a student exchange experience mediated their changes in global self-esteem measured before and after the exchange experience. The findings from the aforementioned studies illustrate the logic behind our hypothesis that high levels of state MIL over the course of graduation events should relate to increases in global levels of MIL. That is, people who perceive greater MIL over the course of graduation may be more immersed in this developmental task, and therefore MIL might become more salient to those individuals' self-concepts. Along the same lines, decreased levels of state MIL during the course of graduation events could lead to reductions in global MIL. Put more simply, we hypothesize that there should be a positive relationship between state MIL and trait MIL.

From a sociogenomic perspective (Roberts & Jackson, 2008), in order for graduation to have an impact on global MIL, the experiences around graduation must also be germane to state MIL. We therefore sought to determine whether state MIL could be predicted by the ways in which students spent their time over the course of graduation events. There is already some evidence that MIL relates to the activities in which college students typically participate. College students (sophomores) with higher MIL spent more time exercising, in class/studying, attending parties, and talking with friends, and attending educational workshops; they spent less time watching TV and playing video/computer games (Molasso, 2006). In addition to behavioral activities, thoughts about graduation might also be salient to judgments of MIL. Students who thought more about the impending end to their college experience showed greater participation in college-related activities and enhanced subjective well-being leading up to graduation (Kurtz, 2008). Graduating students also experienced more poignancy when thinking about college coming to a close (Ersner-Hershfield et al., 2008), and this effect was strongest among students who identified highly with their college (Zhang & Fung, 2009). Therefore, we examined whether state MIL is related to how graduates choose to spend their time over the course of graduation: to the company they keep, the activities with which they are involved, and the degree to which they thought about their time at university.

Overview of Research

The impetus for this research is in keeping with the idea that developmental tasks are especially fertile ground upon which to explore consequential changes in psychological development (Hutteman et al., 2014). It is possible for important events that demarcate a transition point in a developmental task to evoke changes that can be detected over relatively short timeframes (Luhmann et al., 2014). As such, we employed an experience sampling methodology to assess whether variations in state MIL were related to the experiences of students over the course of graduation from college, and further we examined whether state MIL during graduation influenced global MIL one week following graduation (above and beyond global MIL assessed one week prior to graduation). In all of our measures of MIL, we took a phenomenological approach, that is, consistent with previous research, we privileged the individuals' subjective experience of MIL (Heine, Proulx, & Vohs, 2006; King & Hicks, 2009). There are many ways in which people can define, achieve, or strive for meaning, but we relied on the self's judgment of whether or not life is meaningful.

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Study 1: Graduating Students

Methods

Participants—Participants were 74 undergraduates (21 males, 53 females) attending a university in the mid-western United States, who were recruited by e-mail from the listserv for graduating students. Individuals indicating an interest in the study received a link to a webpage where they could obtain more information and enroll in the study. Participants were compensated for their text messaging expenses and received up to $20 based on the number of complete text message responses.

Procedure—Participants provided informed consent online – the consent form notified participants that their responses to the online surveys and their text-messages would be de-identified and would remain confidential. There were three parts to the study procedure. The first part involved participants completing an online survey one week prior to commencement. The second part was an experience sampling protocol in which participants responded to questions three times per day for three days over the course of graduation (described in more detail below). The third part involved completing a follow-up personality survey online one week after commencement (all participants reported that they attended commencement). All methods received ethical approval at Northwestern University.

Text-messaging protocol: Individuals who completed the initial survey were contacted by a researcher and were e-mailed an electronic document containing a 6.5 cm × 9 cm card, on which appeared items assessing meaning in life and one's current activities. Participants were instructed to print the card and carry it with them during the days on which the study was conducted. Cards also included additional items assessing affective (e.g., positive and negative affective adjectives), behavioral (Big 5 personality states), and cognitive experiences (e.g., appraisals of situational characteristics) that were not relevant to this particular study, and a total of 36 items were presented on the card.

Three times per day during the day prior to commencement, the day of commencement, and the day following commencement, participants received a text message (sent from a secure-email account using Applescript) requesting that they respond to the items on their card. These requests were sent on the day before and the day after commencement at 10 A.M., 3 P.M., and 8 P.M. On the day of commencement, participants received requests as they were waiting in line before commencement (10:30 A.M.), thirty minutes following the commencement ceremony (1 P.M.), and at 8 P.M. Participants replied by sending a text message to the secure e-mail account containing a string of numbers, one corresponding to each item on their card. Participants completed 538 out of 666 possible reports (80.8 %), which is similar to the response rate in most experience sampling studies (Bleidorn, 2009; Green, Rafaeli, Bolger, Shrout, & Reiss, 2006; Wilt, Condon, & Revelle, 2011).

Measures

Trait meaning in life: Participants completed an assessment of trait MIL on the initial and follow-up surveys. Measures of trait MIL assess a participant's sense of MIL in general. We employed items from the Purpose in Life scale (Crumbaugh & Maholick, 1964) to assess

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meaning trait MIL. We selected the four items from this scale that have been shown by previous research (McGregor & Little, 1998; Schulenberg et al., 2011) to specifically assess the experience of purpose and meaning in life as opposed to than general happiness or general well-being. These items were, “In life, I have very clear goals and aims,” “My personal existence is very purposeful and meaningful,” “I have clear goals and a satisfying purpose in life,” and “I regard my ability to find a meaning, purpose, or mission in life to be very great.” Items were rated on a 6-point scale, ranging from 1 (“very inaccurate”) to 6 (“very accurate”). Cronbach's α reliabilities for MIL were .84 (initial survey) and .88 (follow-up survey). The average inter-item correlations for these measures were .57 (initial survey) and .66 (follow-up survey), indicating that items within each scale were associated strongly with each other.

Text-messaging assessment of state meaning in life, activities, and positive affect: In contrast to trait MIL, measures of state MIL assess one's sense of MIL over relatively shorter periods of time. To assess state MIL, participants reported the degree to which they agreed with the statements “Felt that I had very clear goals and aims”, and “Felt that I had a meaningful purpose in life” on a scale from 1 (“not at all”) to 6 (“very”) over the previous 30 minutes (e.g., “Over the previous 30 minutes, I...”). The items used to assess MIL have been shown as reliable and valid indicators of experienced MIL over a short timeframe (King et al., 2006). Participants also completed eight questions about their current activities over the previous 30 minutes. Questions were presented as dichotomous with yes / no answers (e.g., “Over the previous 30 minutes, did you spend time with friends?”) and assessed whether participants (1) spent time with friends, (2) spent time with family, (3) spent time with a romantic partner, (4) spent time alone (5) thought about their time at college, (6) took pictures, (7) were at a favorite restaurant, bar, or coffee shop, and (8) took part in a university-related club or activity. As previous research (e.g., King et al., 2006) has shown that state MIL is related to state positive affect (PA), we assessed state PA by having participants indicate how they currently felt (“Right now, I feel...”) on the following adjectives: “elated”, “joyful”, and “happy.” Ratings were made on a scale from 1 (“not at all”) to 6 (“very”).

Results

Preliminary analyses—Descriptive statistics, reliabilities, and intercorrelations for trait MIL assessed at baseline, the aggregate means of state MIL and state PA, and trait MIL assessed at follow-up were conducted using the base functionality in R (R Development Core Team, 2014) and the *psych* package (Revelle, 2014). These results are displayed in Table 1. The high intraclass correlation coefficient (*ICC2*; Bartko, 1976; Shrout & Fleiss, 1979) for experience-sampling MIL and PA indicated that participants could be reliably differentiated in terms of average MIL and PA over the course of graduation. In other words, participants differed significantly in their average tendency to experience state MIL and state PA during the commencement week. The between-person correlations showed that individuals who experienced greater state MIL during graduation had higher trait MIL one week prior to graduation and one week after graduation. The strong association between initial and follow-up trait MIL indicated a high degree of rank-order stability in trait MIL over the course of the study, as 48% of the variance in follow-up trait MIL could be

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accounted for by baseline trait MIL. The positive and significant associations between measures of MIL and PA indicate that it will be important to control for the influence of PA.

Variation in MIL: The data in this study had a multilevel structure, with text-messaging reports (level 1) nested in persons (level 2). Standard (ordinary least squares, OLS) regression approaches assume that each observation in a data set is independent and are not appropriate for multilevel data because hierarchically structured data violate this assumption of independence. Thus, we employed multilevel modeling (MLM) procedures to analyze the data as MLM permits the analysis of interdependent data without violating the assumptions of standard multiple regression (Bryk & Raudenbush, 2002). Compared with OLS analysis of multilevel data, MLMs provide more accurate standard errors and more reliable tests of within-person and between-person effects. Importantly, simulation studies have shown that the sample size of level 2 units ($N = 74$) and level 1 units ($N = 538$) in the current study provided adequate power for detecting moderate effect sizes at the within- and between-person levels using multilevel statistical approaches (Scherbaum & Ferreter, 2009).

An important preliminary step in MLM analyses is to determine the extent to which people differ in their moment-to-moment experience of state MIL (within-person variation) as well as the extent to which they differ from each other in their overall experience of state MIL (between-person variation). To do this, we conducted a basic MLM without any predictors (the unconditional means model) in order to decompose the total variance in MIL into its within-person and between-person components. Results from this model showed substantial within-person variability (*within-person variance = 0.*56; *within-person, SD = 0.*75) as well as between-person variability (*between-person variance* = 1.06; *between-person, SD* = 1.03) in state MIL. The within-person variation accounted for 35% of the total variance in MIL. These results allow for examination of explanations of both within-and-between person variations in MIL over the course of graduation.

Within-Person Associations Between Activities and Meaning in Life—The within-and between-person variation in state MIL over the course of graduation gave rise to the question why some students experienced more MIL around graduation than others? To begin with, we examined their activities during this week in order to understand what graduates do when experiencing different levels of MIL. In order to address this question, we first conducted one MLM analysis predicting state MIL from all activity variables individually. Then, to account for a potential overlap between activities, all predictor variables were entered simultaneously in one MLM, with state MIL as the outcome variable. Activity variables were treated as dichotomous, categorical variables in each analysis. Associations between variables in MLMs were estimated by unstandardized *b* coefficients indicating the degree to that MIL was predicted to differ between "yes" as compared to "no" responses to each activity question. For instance, a *b* of 1.3 for being at a restaurant would indicate that MIL was on average 1.3 points higher when at a restaurant as compared to when not at a restaurant. MLM analyses predicting state MIL from activity variables were conducted in R using the package *nlme* (Pinheiro, Bates, DebRoy, & Sarkar, 2012).

Results from MLMs are displayed in Table 2. The *p-values* reported in the table are adjusted for multiple comparisons using Holm's (1979) method. In the individual MLMs, state MIL

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was negatively related to being alone and positively related to being with family and thinking about university. In the simultaneous MLM, thinking about university was the only activity that was uniquely, positively associated with increases in state MIL. There were two more results from the simultaneous MLM that showed 95% confidence intervals that did not include zero. Specifically, *being alone* and *being at a restaurant* appear to be negatively related to state MIL, however, these effects were were not significant after correcting for multiple comparisons. We then conducted another MLM including all activity variables as well as state PA as predictors of state MIL. Results showed that thinking about university retained its positive association with state MIL ($b = .24$, 95% $CI = .06$ to .41). State PA was also positively associated with state MIL in this model ($b = .18$, 95% $CI = .10$ to .26).

The results presented above showed that the significant effects of being alone and with family on state MIL did not hold when accounting for all other activity variables. In order to examine the possible dynamic associations among activity variables and PA, we next constructed a multilevel mediation model. The mediation model was conducted using a MLM path analytic approach (Muthén & Asparouhov, 2011; Preacher, Zhang, & Zyphur, 2011; Preacher, Zyphur, & Zhang, 2010). The model examining relations between activities and state MIL had a 1-1-1 MLM structure, meaning that all variables in the model were assessed at level 1. The associations between variables in MLM path models were estimated by unstandardized b coefficients, which are partial regression coefficients that quantify the magnitude and direction of association in changes in the dependent variable with changes in the independent variable. The 1-1-1 multilevel path analysis was conducted in *MPlus version 7.1* (Muthén & Muthén, 2012).

We tested a 1-1-1 multilevel mediation model in which present company (alone, with family) influenced state MIL via thinking about university. Figure 1 shows the path coefficients from this analysis, and Table 3 displays the full results of the model. Being alone had a negative association with thinking about university, whereas being with family had a positive association on thinking about university. In turn, thinking about university had a positive association with state MIL (being alone also had a unique, negative association with state MIL). The indirect effect from being alone to state MIL via thinking about university was negative, $b = -.07$, $p < .01$ (95% $CI = -.13$ to $-.02$), whereas the indirect effect of being with family to state MIL via thinking about university was positive, $b = .03$, $p < .05$ (95% $CI = .002$ to .06). Thus, the negative bivariate association of being alone on state MIL was partially mediated by thinking less about one's time at university, whereas the positive bivariate association between being with family and state MIL was partially mediated by spending more time thinking about one's time at university.

We conducted a follow-up model specified as above but also controlling for the covariation of state PA with state MIL. State PA and state MIL were positively related to one another in this model, $b = .15$, $p < .05$ (95% $CI = .07$ to .23). The direct effect of thinking about university on state MIL remained significant, $b = .20$, $p < .05$ (95% $CI = .05$ to .35). Furthermore, the indirect effect from being alone to state MIL via thinking about university remained significant, $b = -.05$, $p < .05$ (95% $CI = -.10$ to $-.003$), and the indirect effect of being with family to state MIL via thinking about university was nearly statistically

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significant, $b = .02$, $p < .05$ (95% $CI = -.002$ to .05). Thus, the inclusion of state MIL resulted only in very small changes to the relations among activities and state MIL.

Does State MIL Predict Changes in Global MIL?—Finally, we tested whether state MIL during the week of commencement influenced global judgments of trait MIL (above and beyond student's global judgments of MIL prior to commencement week). We also employed a MLM path analytic approach to examine this question. This path model had a 2-1-2 MLM structure. That is, the path between variables assessed at level 2 (initial trait MIL and follow-up trait MIL) were modeled as traveling through variables assessed at level 1 (state MIL experienced during graduation and the slope of state MIL over time during graduation). The associations between variables in MLM path models were again estimated by unstandardized *b* coefficients.

The MLM path model testing whether state MIL predicted changes in global MIL following graduation (while controlling for global MIL prior to graduation) is depicted in Figure 2, and the full results of the model are shown in Table 4. The unstandardized regression estimates (*b*s) showed that baseline MIL predicted both the intercept (mean level) of state MIL experienced during graduation as well as follow-up, global judgments of trait MIL. Experience-sampling MIL predicted follow-up MIL above and beyond baseline MIL, supporting our hypothesis that students' sense of MIL over the course of this major life event was relevant for short-term changes in their global sense of MIL. A graphical depiction of the relation between experienced MIL and follow-up MIL is given in Figure 3, which shows participants' MIL scores at follow-up as a function of the residuals of average experienced MIL residualized for initial MIL.

The slope of state MIL experienced during graduation was not related to baseline or follow-up MIL. This indicated that changes in state MIL experienced over the course of graduation did not depend on one's trait level of MIL prior to graduation, nor did changes in state MIL influence later trait levels of MIL post-graduation.

The total effect of baseline MIL on follow-up MIL was $b = .76$, $p < .001$ (*95% CI* = .62 to .89), and this effect was partially mediated by the intercept of experience-sampling MIL ($b = .20$, $p = .012$, *95% CI* = .04 to .35). This meant that part of the effect of initial MIL on follow-up MIL traveled through an individual's average level of MIL over the course of graduation. The slope of state MIL experienced during graduation did not mediate the path from baseline MIL to follow-up MIL ($b = .03$, $p = .679$, *95% CI* = −.10 to .15). That is, changes in MIL over the course of graduation did not explain the association between trait levels of MIL prior to and following graduation.

An additional multilevel path analysis was conducted to address concerns regarding whether state MIL predicted follow-up MIL over and above initial MIL simply because the reports of state MIL were more proximal in time to follow-up MIL. If proximity in time were an issue, we would expect that that follow-up MIL would be more strongly related to MIL measured later in the experience-sampling period. Therefore, we examined whether reports of state MIL provided at different times during the study were differentially related to follow-up MIL. To represent time, we created a continuous variable reflecting the order of text-

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messaging responses, from the first ("1") through last ("9") response, and tested whether this variable moderated the effect of state MIL on follow-up MIL. Results showed that the interaction of time and state MIL predicting follow-up MIL was not significant ($b = .19$, $p = .11$). Thus, we did not find evidence that the association between follow-up MIL and experience sampling MIL depended upon the proximity of experience sampling MIL to the follow-up measure.

General Discussion

Students' global sense of MIL was highly stable over the two-week period surrounding graduation from college; however, sense of MIL was not completely static during this time. Rather, at the within-person level, short-term judgments of state MIL were decreased by spending time alone and enhanced by spending time with family and by thinking about one's time at university. Further, the within-person relations between state MIL and with spending time alone and with family were partially mediated by thinking about university. In turn, at the between-person level, graduates who experienced higher levels of MIL over those few days around graduation reported a higher global sense of MIL after graduation, even when controlling for MIL assessed the week prior to graduation. These results suggest that, at least in the short term, the way in which graduates spend their time over the course of graduation has implications for the meaning that they perceive in life.

Our findings regarding the relations between activities and state MIL are consistent with the premises of sociogenomic theory (Roberts & Jackson, 2008). One main hypothesis of this theory is that "environments cause changes in states" (Roberts & Jackson, 2008, p. 1535). Although we cannot make causal claims regarding our findings due to the correlational design of the study, we showed that different environments were related to variations in psychological states.

Specifically, individual MLMs showed that when people were in environments in which they were alone, they thought less about their experiences at university. In contrast, when people spent time in environments with other people and with family, they thought more about their time at university. Further, a multilevel mediation model showed that the relations between being alone and with family to state MIL were partially mediated by thinking about university. Thus, cognitive reflection about one's time at university was instrumental in linking environmental contexts to psychological states in which the presence of MIL was salient. The dynamic relations among states observed in the current study illustrates that the transactions between people and their environments can be instrumental in the how a person experiences a given situation (Fraley & Roberts, 2005). People can shape their environmental experiences through proactive choice, and environments may elicit affective, behavioral, and cognitive responses from a person.

We further examined whether state MIL during graduation might relate to judgments of global MIL one week following graduation. This idea was based on the premise that transitional experiences, such as the developmental task of graduation, can be imprinted more deeply in one's psyche via bottom-up processes (Roberts, 2009). Indeed, a second main hypothesis of sociogenomic theory is that changes in states "affect changes in traits in

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a bottom-up fashion" (Roberts & Jackson, 2008, p. 1535). In support of this premise, we found that people who experienced more MIL during graduation had higher global levels of MIL following graduation. This result builds upon previous studies showing that short-term states experienced during a developmental task can lead to changes in global traits (Bleidorn, 2012; Hutteman et al., 2015).

The current findings might also be considered particularly notable precisely because of the short-time span over which changes in trait MIL took place. The other studies that have observed evidence consistent with a bottom-up perspective on personality change have been conducted over a period of at least one year based on the assumption that personality changes occur gradually over that time frame (Bleidorn, 2012; Hutteman et al., 2015). In contrast, the current study showed that predictable changes in MIL may happen rather quickly, within the span of just a few weeks. The question of whether the observed, short-term changes in trait MIL will persist over the long term are of central importance, as the persistence of these changes would provide a link between short-term psychological changes and longer-term development.

Changes in MIL – in the short-term and long-term – are important due to the vast array of ramifications that MIL has for psychosocial health (e.g., Krause, 2007; Mascaro & Rosen, 2005; Steger, Kashdan, Oishi, 2008; Steger, Oishi, & Kashdan, 2009). Trait meaning in life has been linked to psychological well-being at every stage of life, as well as to other positive psychosocial outcomes such as work enjoyment, happiness, love, self-esteem, hope, and optimism; lack of meaning has been associated with anxiety and depression, suicidal ideation, boredom, drug and alcohol use, and excessive gambling (see Schulenberg et al., 2011 for a review). The findings linking MIL to healthy psychosocial functioning provide a clear impetus for future studies to examine longer lasting changes in MIL and their associations with mental and physical health.

Limitations and Future Directions

This study is limited in that it cannot conclude that the experience of MIL specifically during graduation was particularly relevant to changes in one's global sense of meaning in life. Rather, it could be that MIL over the course of routine, daily life is just as predictive of changes in trait meaning in life, and this possibility awaits future research. Future studies examining change in MIL over time would do well to adhere to the integrative approach proposed by Heller and colleagues (2009). They advocated a quasi-experimental design in which only a portion of the sample being studied undergoes a transition (such as graduation from college). In this design, participants complete reports of their traits before and after the transition, and they complete experience-sampling protocols before and after the transition as well (between the assessments of traits). This type of study is well-suited to examine whether short-term experiences relate to change in traits (Bleidorn, 2012). Additionally, future studies may build on our initial findings by including additional measures of trait and state MIL, as well as other measures of variables related to MIL.

It will also be important for future research to explain our finding that thinking about one's time at university contributed to increases in MIL. One potentially explanation is offered by the narrative identity perspective (McAdams, 2008). According to this approach, the

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psychological construction of life-stories brings together one's remembered past and imagined future into a narrative identity that provides life with some degree of unity and purpose (McAdams, 1996). When graduates reported thinking about their time at university, they might have been engaging in autobiographical reasoning, which is the process of actively constructing life-stories (McLean & Fournier, 2008). Autobiographical reasoning involves linking events from the past to the present and reasoning about how those experiences are relevant to the future. Graduates who did this more often might have been likely to generate meaningful connections between who they were, who they are, and who they will be, and thus would be more likely to report a higher sense of MIL when engaging in this process.

Another limitation of our study is that it consisted only of college students graduating from an American university, as the experience of meaning in life across important life transitions may differ across ages and across cultures (Steger, Kawabata, Shimai, & Otake, 2008; Steger et al., 2009). Indeed, future research should take into account the potential moderating roles of age and culture on meaning in life during the developmental task of graduation. This type of research might be especially important given that differences in the timing of developmental tasks across cultures could be relevant to personality changes (Hutteman et al., 2014). For instance, Bleidorn et al. (2013) showed that cultures with earlier transitions to adult roles were marked by earlier personality maturation. This result is particularly relevant to potential future research relating to our findings, as it suggests that college graduates may differ in maturity across cultures. These maturity differences could potentially impact the psychological experience of MIL derived from graduation.

Conclusion

The experience of MIL is uniquely salient when graduating from college. Given the implications for well-being that come from success or failure at this task, it is important to identify strategies that may help young adults to create a sense of meaning in the short-term and that may also have long-term ramifications for one's overall sense of MIL. When graduating students in our sample spent time with others, with family, and thought about their time at university, they were more successful than others at generating meaning and meaning over the days surrounding commencement. The individuals who were more successful in generating meaning in turn reported higher global levels of MIL one week after graduation, attesting to the importance of engaging in a salient developmental task. Whether those individuals reap the benefits of greater MIL over the long haul remains to be seen.

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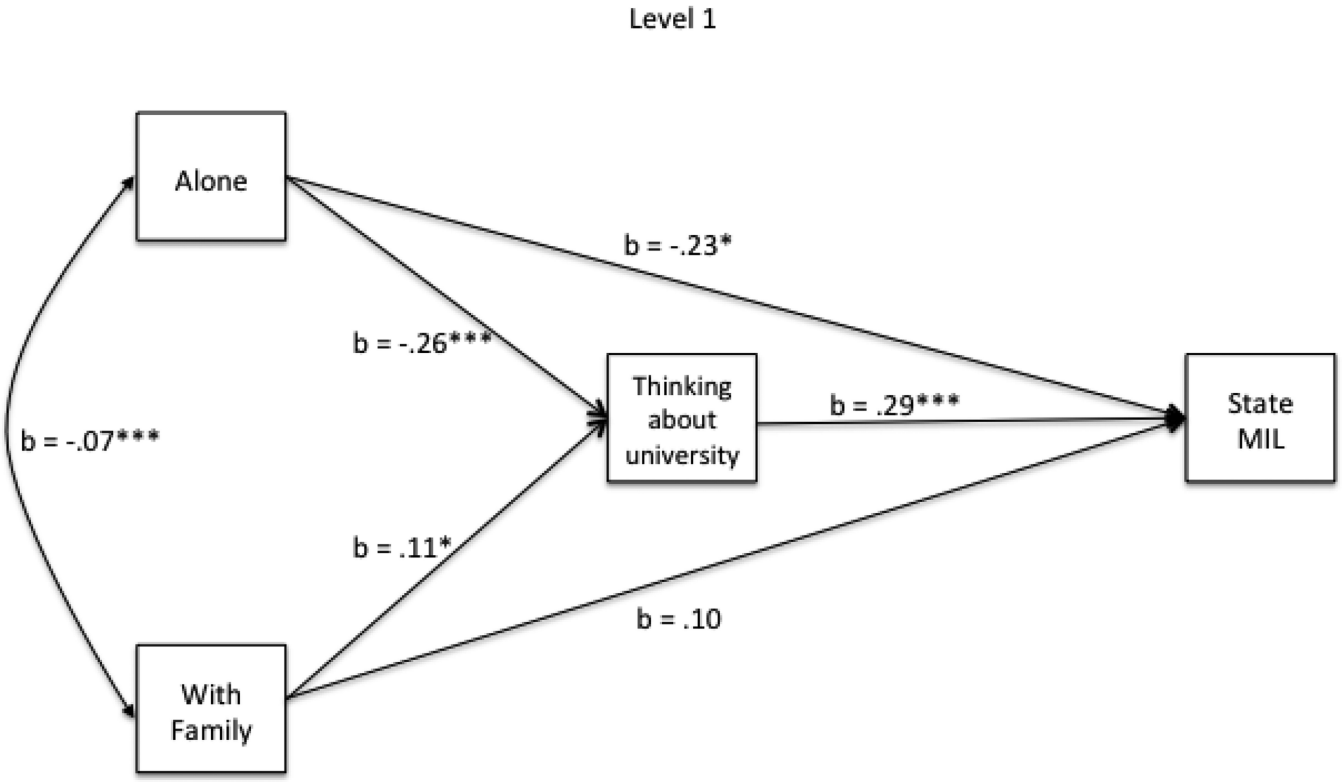

Figure 1.

1-1-1 Path model depicting the relations between companionship (being alone, with family), thinking about university, and state purpose in life (State MIL) in Study 1. "b" = unstandardized regression coefficient. The indirect effect from being alone to state MIL via thinking about university was negative, $b = -.07$, $p < .01$ (95% $CI = -.13$ to $-.02$), whereas the indirect effect of being with family to state MIL via thinking about university was positive, $b = .03$, $p < .05$ (95% $CI = .002$ to $.06$). * = $p < .05$; *** = $p < .001$

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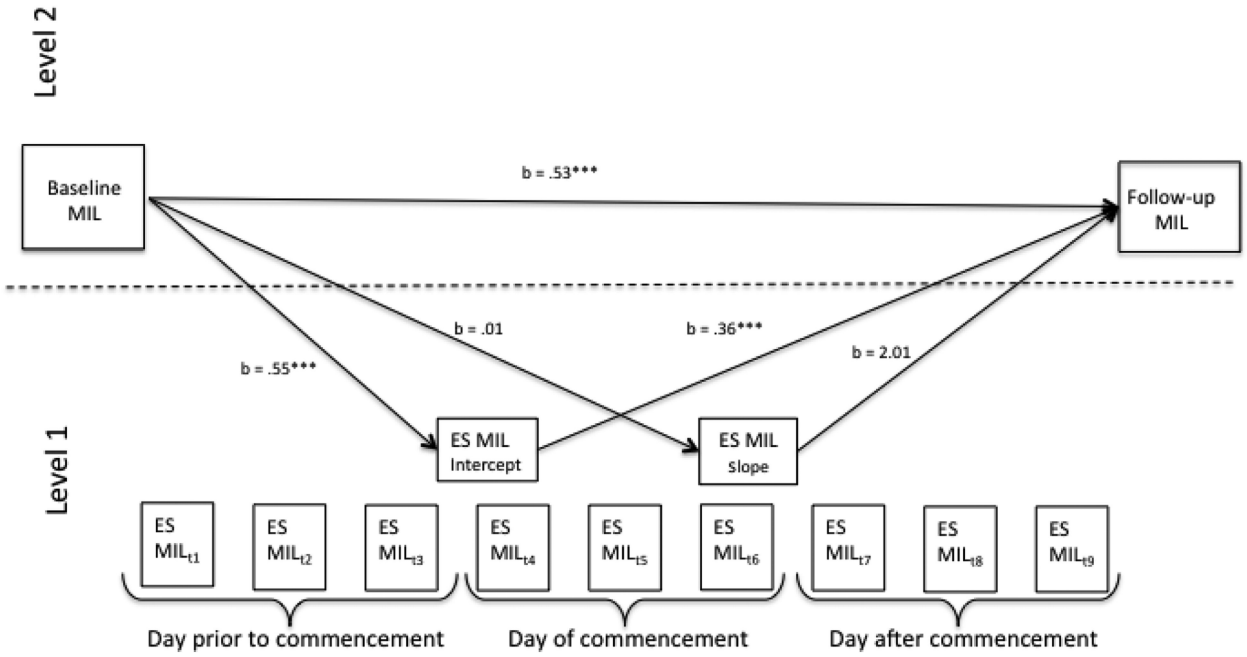

Figure 2.

2-1-2 Path model depicting the relations between trait MIL measured 1 week prior to graduation (baseline MIL), the intercept (mean level) of experience-sampling (ES) reports over the course of graduation (ES MIL Intercept), the slope of state MIL over the course of graduation (ES MIL Slope) and trait MIL one week after graduation (Follow up MIL). Experience-sampling reports of MIL were taken three times per day on the day before commencement, the day of commencement, and the day after commencement. Initial and Follow-up MIL are conceptualized as Level 2 variables, and the ES MIL intercept and slope were Level 1 variables in this model. "b" = unstandardized regression coefficient. *** = $p < .001$.

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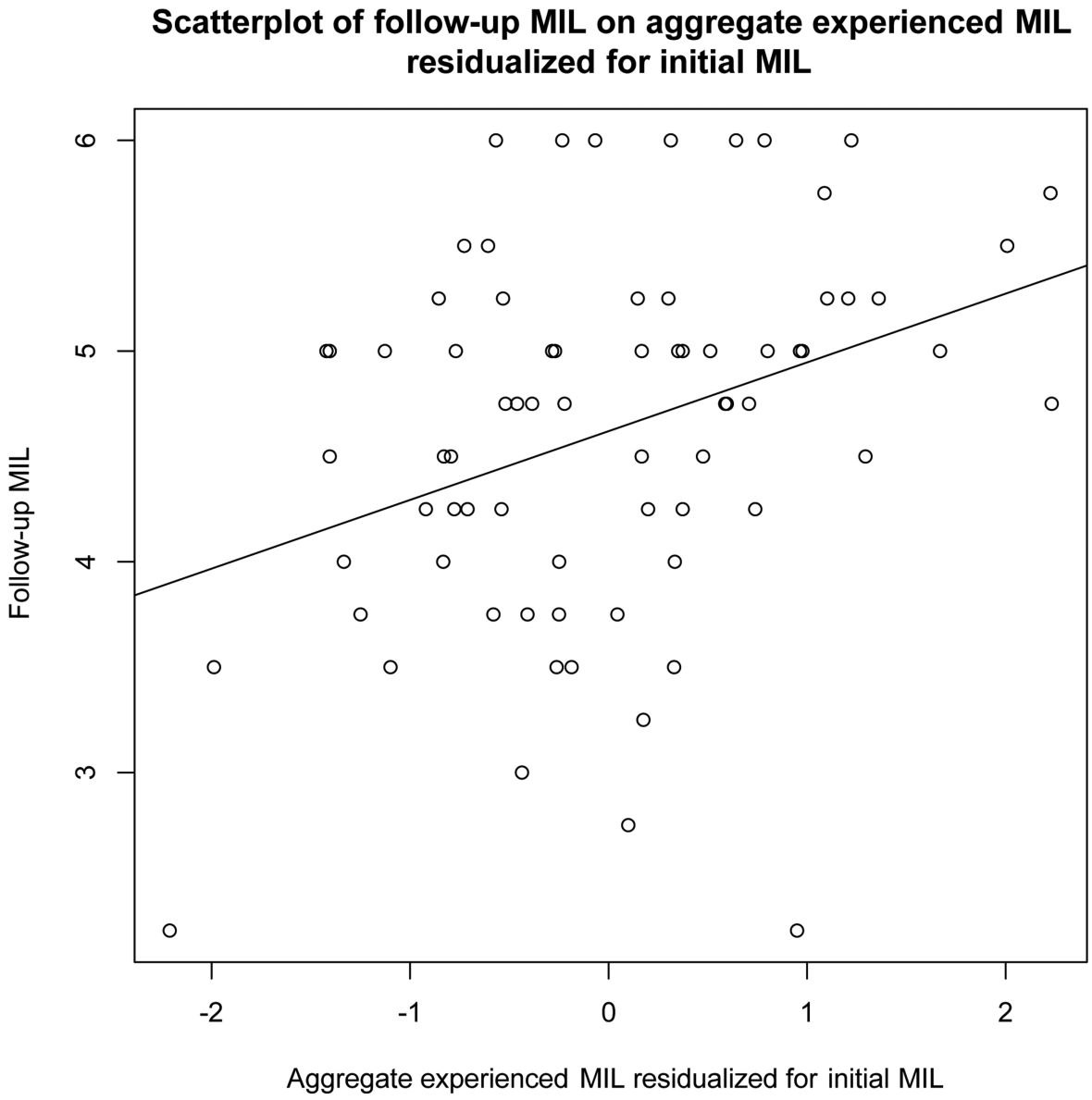

Figure 3.

Scatterplot showing participants' trait MIL scores at follow-up as a function of the residuals of aggregate experienced state MIL residualized for initial trait MIL in Study 1. The slope of the regression line was $b = .33$, $p < .01$.

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Table 1

Descriptive Statistics, Reliabilities, and Intercorrelations

Variable	M	SD	Reliabilities	Between-person correlations		
				1.	2.	3.
1. Baseline MIL	4.73	0.80	0.84[a]	--		
2. Experience-sampling MIL	3.50	1.08	0.93[b]	.45	--	
3. Follow-up MIL	4.64	0.88	0.88[a]	.69	.62	--
4. Experience-sampling PA	3.66	0.88	0.86[b]	.29	.49	.47

Note. N = 74. All p's < .001.

The aggregate means (M) for experience sampling reports of meaning in life (MIL) and positive affect (PA) represent the average of individuals' aggregate mean levels of MIL and PA, and the standard deviations reflect the between-person SDs. The baseline measure was taken 1 week prior to graduation; experience-sampling reports were taken three times per day for three days over the course of graduation events; the follow-up measure was taken 1 week after graduation.

[a] Cronbach's α

[b] Intraclass Correlation (ICC)2.

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Table 2

Results of Multilevel Models Predicting MIL from Activity Variables.

	Results from individual MLMs			Results from simultaneous MLM		
Activity	***b***	***95% CI***	***p-value***	***b***	***95% CI***	***p-value***
With friends	.12	−.03 to .27	.56	−.03	−.21 to .15	1.00
With family	.23	.08 to .39	.02	.12	−.05 to .29	.89
With romantic partner	.02	−.21 to .24	1.00	−.00	−.24 to .24	1.00
Alone	−.35	−.51 to −.19	< .001	−.24	−.42 to −.04	.13
Thinking about university	.38	.22 to .53	< .001	.32	.15 to .49	< .001
Taking pictures	.13	−.03 to .28	.56	.03	−.16 to .22	1.00
At a restaurant	−.15	−.33 to .03	.56	−.22	−.40 to −.03	.13
At a club or university activity	.00	−.18 to .17	1.00	−.13	−.33 to .07	.89

Note. “b” =unstandardized within-person regression coefficient. The p-values reported in the table are adjusted for multiple comparisons using Holm's (1979) method.

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Table 3

Direct Effects Results from the 1-1-1 Path Model.

Path	*b*	*S.E.*	*b/S.E.*	*P-Value*	*95% CI for b*
Alone with Family	−.07	.01	−6.42	< .001	−.10 to −.05
Thinking about university ON Alone	−.26	.06	−4.34	<.001	−.37 to −.14
Thinking about university ON Family	.11	.05	2.34	<.05	.02 to .21
State MIL ON Alone	−.23	.09	−2.55	<.05	−.40 to −.05
State MIL ON Family	.10	.10	1.00	.32	−.09 to .28
State MIL ON Thinking about university	.29	.07	3.89	<.001	.14 to .44

Note. Within-person direct effects from the path model depicting the relations between companionship (being alone, with family), thinking about university, and state meaning in life (State MIL). "*b*" = unstandardized regression coefficient. "*SE*" = standard error of the *b* coefficient.

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Table 4

Direct Effects Results from the 2-1-2 Path Model.

Path	*b*	*S.E.*	*b/S.E.*	*P-Value*	*95% CI for b*
State MIL Intercept ON Baseline trait MIL	.55	.19	2.88	<.001	0.18 to 0.09
State MIL Slope ON Baseline trait MIL	.01	.02	.59	.55	−0.03 to 0.05
Follow-up trait MIL ON Baseline trait MIL	.53	. 09	5.82	< .001	0.35 to 0.71
Follow-up trait MIL ON State MIL Intercept	.36	.09	3.99	< .001	0.18 to 0.53
Follow-up trait MIL ON State MIL Slope	2.02	2.90	.70	.48	−3.67 to 7.70

Note. Direct effects results from path model depicting the relations between initial trait MIL measured 1 week prior to graduation (baseline trait MIL), the intercept (mean level) of experienced state MIL reports over the course of graduation (State MIL Intercept), the slope of state MIL over the course of graduation (State MIL Slope) and trait MIL one week after graduation (follow-up trait MIL). "*b*" = unstandardized regression coefficient. "*SE*" = standard error of the *b* coefficient.